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outbreak was of limited extent, only 85 cases in all having been officially reported.

Southern Asia.—Cholera is being reported from localities throughout southern Asia from the Mediterranean ports of Asia Minor in the west to the seaports of China in the east.

THE BEDBUG.

By W. C. RUCKER, Assistant Surgeon General, United States Public Health Service.

Little by little the realization is growing that it is the living environment of man which brings disease to him. The inanimate disease carrier is daily becoming less of a bugaboo, and the human, the animal, and the insect germ vehicles are coming to be recognized as the great disseminators of suffering and death. The mosquito, the fly, the flea, and the louse have all been definitely incriminated of the nefarious crime of spreading disease, and recently it has been proven that a bedbug, the first cousin of the variety which we have in America, transmits kala-azar, a fever of India. The common garden variety of bedbug has been accused of transmitting relapsing fever and bubonic plague. The bedbug has been called by various names: The "mahogany flat," the "cinch" or the "chinch," the "wall louse," and Mark Twain, describing the variety found in Switzerland, called it a "chamois." Its scientific name is *Cimex lectularius*.

This bug, which has been the *bête noir* of all good housewives since time immemorial, is one of the oldest associates of man; in fact it is not at all improbable that when our arboreal forebears forsook tree tops for caves they took this little six-legged pest with them. This seems the more likely because the English sparrow and the swallow harbor a very similar species, and not infrequently their nests are crowded with these vermin. It may be mentioned parenthetically that bed bugs are not infrequently found in chicken houses.

In all his peregrinations around the earth man has carried the bedbug with him. Its occurrence in ships is notorious, and it seems to regard neither heat nor cold. Ever since the days of the Roman galleys the bedbug has been a ubiquitous and continuous traveler. Certainly this parasite, of which there are several varieties, is even to-day a frequent accompaniment of travel, and is not infrequently introduced into the home of man in luggage. Furthermore, this insect undertakes pilgrimages from one house to another, and may make its residence in one place, going to another daily in search of food. This is particularly apt to occur from closed houses. When the hungry insect is deprived of his usual boarding place he will start out through holes in walls, along plumbing, or even over roof gutters in search of sustenance.

"Bedbug" is a word which does not receive the sanction of the polite. This undoubtedly arises from the horror which their discovery creates in the feminine breast, and because of the shame which, in the popular mind, they bring to the careful housewife. In a way the antipathy for this insect is a valuable thing, and if the housewife would extend it to include the fly as well our nation would make a long stride forward toward the goal of health. It is only fair, however, to state that bedbugs are not a disgrace. They are, how-

ever, a positive danger. Their presence in the house may mean merely accidental introduction. Their continuance in the house means a disregard for health.

Creatures which live at the expense of other creatures without contributing to their economy are parasites. Nature, however, has made it a rule that every living thing upon the earth must work for its existence or else pay the penalty. Parasites do not work for their living. Instead of developing their freedom of action and locomotion they build up the parts by which they can attach themselves to their host and get food from him. The penalty which the bedbug has had to pay for his parasitism is the loss of his wings. Originally these insects had two wings, but now they are degenerated into little scale-like pads which are useless for purposes of locomotion. On the whole, this is fortunate for mankind, because if they could fly we would have a hard time keeping them out of our houses.

The body of the bedbug is flat, and consists of a headpiece, a thorax, which is divided into three parts, and an abdomen, which is divided into eight parts. It is covered with short, sharp hairs and coarse bristles. On either side upon the front of the head is an antenna, which consists of four parts; these are organs of touch. Just behind them are the eyes. On the lower surface, near the hind legs, are a pair of glands for the purpose of secreting a fluid which gives to the insect its characteristic, pungent, disagreeable odor. This fluid was originally used by the bedbug for the purpose of discouraging its enemies, particularly birds.

The biting apparatus of this parasite is quite elaborate, and consists of several parts. In biting, the bug anchors itself to the skin with a couple of hooks called mandibles, and then inserts the maxillæ, which are shaped like two gutters, the concave surfaces of which look toward each other, and when placed together form a tube. This is used to extract blood from the victim, and also for the purpose of putting saliva into the wound. It is in this way that the bedbug may inject the organisms of disease.

The bedbug is a canny insect. It thrives best in dirty, old houses, in the cracks and crevices of wooden beds, or underneath loose wall-paper, and at night it comes out in search of food. It is not particularly active in winter, sometimes going into hibernation. Normally it feeds upon human blood, but lacking this it will live upon decaying wood or the dust in floor cracks.

It is nocturnal in its habits, and during the day remains hidden away in some dark, quiet place. It is particularly active in its search for food. To illustrate this may be quoted the story of the ingenious traveler, who, in order to keep bedbugs out of his bed, set the legs of the bedstead in pans of water, whereupon the bedbugs climbed the walls, got out on the ceiling over the bed, and dropped down upon the victim. In order to thwart his enemies the traveler was obliged to raise his umbrella.

The eggs are somewhat rounded, white objects, and are laid in collections in crevices or other suitable places. In about a week or ten days after they are laid the eggs hatch out as little worms, called larvæ; these are yellowish white in color at first, but later become almost brown. They feed and then go into a resting state, from which they emerge as pupæ; they then shed their skins five times, and at last become full grown adults. The length of time which this takes

varies with warmth and food supply from 7 to 11 weeks. They are extremely prolific, and may lay several batches of eggs during a season.

Bedbugs are hard to get rid of, once they have found lodgment in the house. The first thing to do is to endeavor to discover their place of concealment and to destroy it. This may mean that the paper may have to be taken from the walls, or if this be not practicable it should be thoroughly pasted down in the places where it has become loosened. Benzine and kerosene may be injected behind wainscoting or applied to floor cracks. Oil of turpentine, corrosive sublimate, or boiling hot water may be used for the purpose of destroying both the adults and the eggs.

None of the insect powders are particularly effective. Fumigation by burning sulphur in the proportion of 2 pounds to the 1,000 cubic feet of air space after closing all the cracks through which the gas might escape is efficacious. The sulphur should be burned in an iron pot which is set upon bricks resting in a tub of water. In this way the danger of setting fire to the premises is obviated. The gas should be allowed to remain in the fumigated room for from 4 to 5 hours. Hydrocyanic acid gas is of course very efficient, but it should always be borne in mind that this is a very dangerous and highly poisonous agent. One way to produce it is to place in an ordinary granite or earthen vessel, common commercial sulphuric acid and then after having made sure that there will be no further cause to enter the room, to drop into the acid a thick paper bag containing potassium cyanide. Then get out of the room quickly, close the door tightly and seal up any cracks around it with paste and paper. Great caution should be used in entering the room again, and it must be thoroughly aired before occupation. This method of fumigation should be applied only by experts.

The bedbug has two enemies, the ordinary cockroach and the little red house ant. It is rather questionable whether it is wise to introduce these insects into a house for the purpose of destroying bedbugs. It is a good deal like boiling cabbage in a house to take away the smell of fresh paint. To get rid of the cabbage smell you have to burn the house.